A NEW CYSTOSCOPE FOR CATHETERIZING THE URETERS BY THE INDIRECT METHOD.

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ALTHOUGH there are many types of cystoscopes offered for sale, still there are but few distinct types which can claim originality in their construction. Kelly has perfected the method of using endoscopic tubes in women, but this has its limitations even in his restricted field.

Nitze devised a cystoscope in which a catheter may be passed through the canal of the cystoscope into the bladder and then, by means of a mechanical device, the direction of the catheter may be so guided that it passes into the mouth of the ureter.

Brenner presented a cystoscope in which it was not necessary to change the direction of the catheter after it passed through the cystoscope, but the cystoscope itself could be manipulated so that the catheter might be made to pass directly into the ureter mouth without becoming bent in its course.

Tilden Brown, in 1898, devised a direct catheterizing cystoscope which was a great improvement over all other types of cystoscope of that class, and allowed the simultaneous catheterism of both ureters.

Casper, of Berlin, in 1901, introduced an indirect double catheterizing cystoscope which was very cumbersome.

Later Brown developed a composite cystoscope which combined a direct catheterizing device and examining telescopes, including a retrograde lens. A year or two later, Lewis, of St. Louis, presented a composite cystoscope which closely resembles the one devised by Brown.

Two or three years ago, Bierhof, of New York, improved the Nitze cystoscope so that the sheath was constructed independently of the telescope which contained the lens and the

illuminating device; without moving the sheath the telescope could be revolved within the sheath so that every part of the bladder might be examined. This instrument, which is made in Europe, has certain distinct advantages.

Each instrument which has been briefly described has certain disadvantages. The Kelly cystoscope requires a large amount of experience for its proper manipulation, and even in the hands of those who have used it most, the results obtained with it are not so satisfactory as those obtained by other methods. In the female, for removal of foreign bodies from the bladder and for local applications for the bladder it is far better; its size, and the consequent dilatation of the urethra which it occasions, are very decided disadvantages; it cannot be used in the male.

The Nitze, which is an indirect cystoscope, is a very attractive instrument, but it, too, has certain disadvantages: first, it is large; second, if it gets out of order it must be sent to Europe for repairs; third, it employs a hot lamp and there is constant danger of burning the mucous membrane of the bladder; fourth, it is impossible to irrigate the bladder and change the medium therein without removing the instrument from the urethra, though it may be done after a very awkward and time-consuming manipulation of the instrument; fifth, the lens cannot be cleansed if soiled; sixth, it is almost impossible, with safety, to withdraw the instrument from the bladder and leave the catheters in place because of the direction of the catheters themselves in passing from the canals in the cystoscope to the ureters, as they are curved in their course and are twisted on their own axis, and bind between the cystoscope and the urethra, and are subjected to so much friction that one cannot be sure that the catheter is not withdrawn from the ureter at the same time that the instrument is withdrawn from the urethra; seventh, the lever which directs the course of the catheter may easily become locked so that it does not lie flat upon the instrument and serious injury may be done to the mucous membrane; and eighth, the instrument is so constructed that the complicated parts cannot be removed by the physician and properly cleaned.

The Bierhof instrument was a distinct advance and allowed the dismemberment of the instrument so that the component parts could be much more easily cleaned. There is one danger connected with his lamp-containing telescope, and that is, the joint between the lamp-carrier and the telescopic tube is so placed that if the beak of the instrument should become caught in the bladder wall, it would be possible, in turning the handle of the instrument, to unscrew the lamp and leave it in the bladder. A second point of disadvantage is the difficulty experienced in preventing the fluid from leaking out alongside the catheter, so that only one size of catheter may be used; also, the instrument presents the same difficulty found in the Nitze in removing it, the catheters are so twisted and bent that it cannot be done without the danger of pulling out the catheters from the ureters.

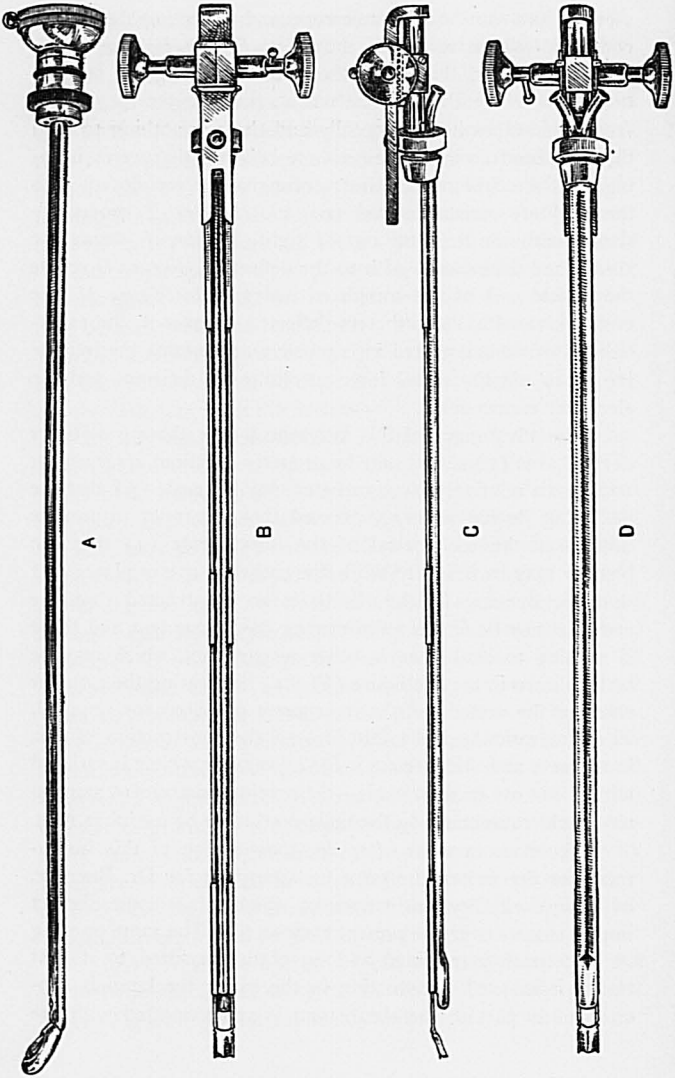
In the instrument devised by the writer, the aim has been to eliminate some of these disadvantages: first, the instrument is made up of three parts that may be dissembled and thoroughly cleaned; all excepting the telescope, containing the lens, may be boiled and sterilized as you would any other instrument. The telescopic tube (*Fig. A*) is complete in itself, containing the lamp and lens; this may be used by itself as a simple examining cystoscope; its size is number 14 French. Attached to this telescope is the device which carries the catheter tubes and a new type of deflector; these catheter tubes may be open or closed as the user desires. The deflector consists of a simple piece of steel hinged on a pinion between two parallel steel-wire bars; as the deflector is advanced it strikes a slightly inclined plane that diverts its axis so that it assumes gradually a position at right angles to the instrument; its relation to the ends of the catheter-carrying device being such that the catheters are deflected to almost any angle desired, the tips of the catheters being, when properly advanced, always within the field of the lens.

Figure B shows a view of the superior surface of the part of the instrument carrying the deflector and the catheter tubes; *Figure C,* a lateral view; and *Figure D,* the inferior

view of the same. This telescope and deflecting device are contained within a sheath shown in *Figure E;* the sheath is so constructed that when the beak containing the lamp is turned, as in the Bierhof instrument, the catheters projecting from their tubes lie horizontally and there is nothing to bind them or bend them in their course between the ureter openings and the tubes, so the instrument may be withdrawn with the slightest resistance and friction. *Figure E* shows the sheath with the deflector out of sight. *Figure F* shows the sheath and the relation of it to the deflector. *Figure G* shows the vesical end of the completed instrument; *Figure H,* the vesical end with the catheters deflected; *Figure I,* the external end of the completed instrument that contains the irrigating tubes and the wheel for controlling the deflector and the electrical connection.

The advantages of this instrument over those previously devised are: (1) that it may be properly sterilized after using; (2) that a relatively large catheter may be used; (3) that the deflecting device is so constructed that it cannot injure the urethra in the withdrawal of the instrument; (4) that the bladder may be irrigated while the catheters are in place; (5) that the opening of the sheath is so constructed that the catheter may lie flat in withdrawing the instrument and there is nothing to bind it as in other instruments, which may be better shown in the last figure (Fig. 1) illustrating the catheter entering the ureter and the instrument prepared for removal. The illustrations give a fair idea of the construction of this instrument and, after using it for a year, the writer is satisfied with it for use in the female—the original instrument causing too much traumatism on the male urethra to be useful in men.

About six months after the construction of this instrument for the writer, the same makers made for Dr. Buerger, of New York City, an instrument which shows some distinct improvements over the present cystoscope. The same opening in the sheath is retained and an obturator fitted to it that makes it easy of introduction in the male; the lamp is constructed as part of the sheath and is not connected with the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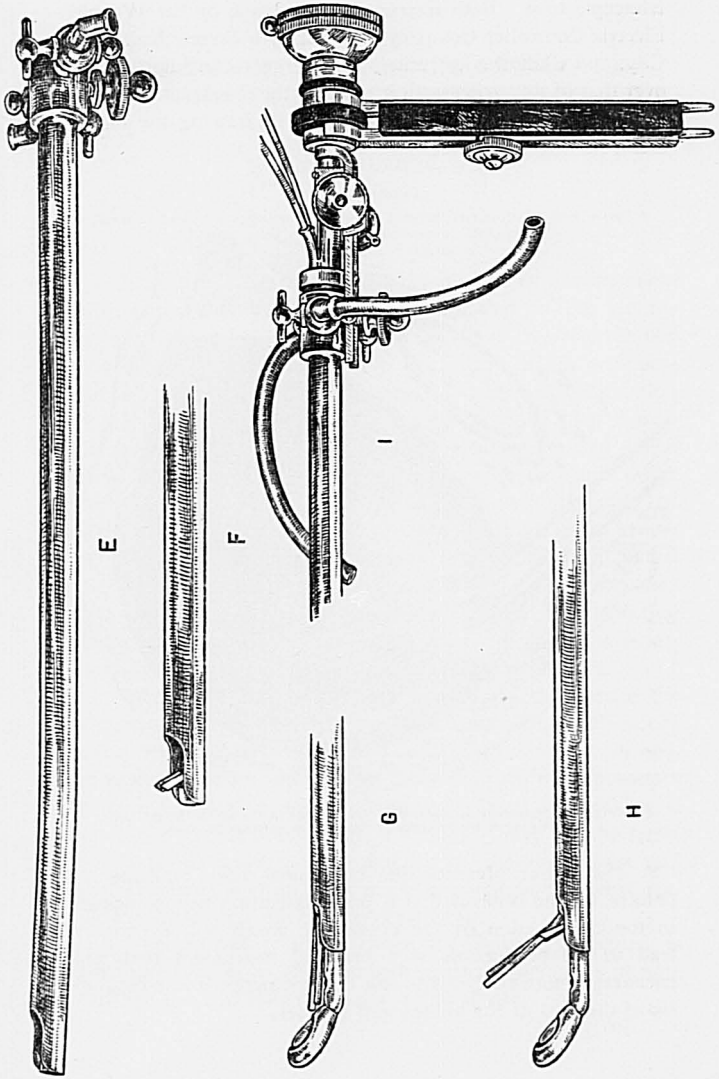
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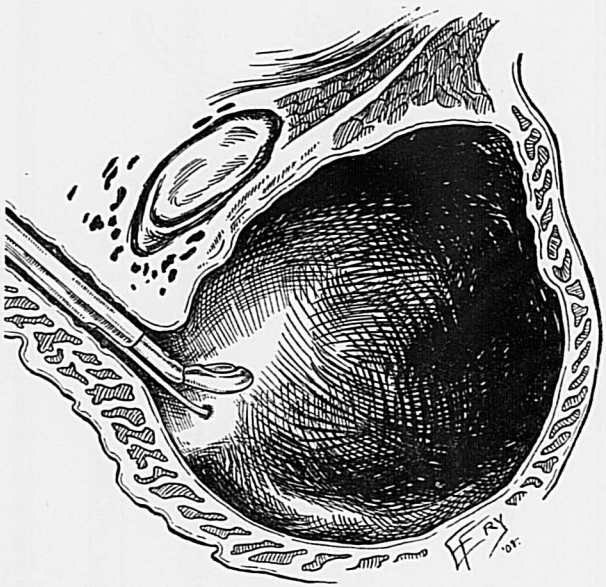
telescopic tube. Both instruments are made by the Wappler Electric Controller Company, of East 87th Street, New York City, and while the instrument of Buerger is an improvement over that of the writer, still it presents the disadvantage which the writer has tried to overcome in withdrawing the instrument, leaving the catheters in the ureters.

FIG. 1.



Showing the cystoscope in place, with the catheter in the ureter, preparatory to removal of the instruments leaving the catheter in place.

The writer presents this instrument fully realizing its defects, but he believes that it presents certain new principles in the construction of the cystoscope which will eventually lead to the production of a practical instrument that will encourage more surgeons to use the cystoscope in the diagnosis of diseases of the kidney and bladder.